

beneath thinly clothed with cinereous pile or short pubescence; the wings subhyaline, the nervures black; the posterior tibiæ broadly expanded towards their apex, and fringed outwardly with black pubescence. Abdomen conical, and thinly clothed beneath with cinereous pubescence.

*Hab.* New Guinea.

3. *TRIGONA ATRICORNIS*. *T. melleo-flava*; flagello, tibiis tarsisque intermediis et posticis nigris.

*Worker.* Length 2 lines. Honey-yellow, smooth and shining; the inner edge of the mandibles rufo-piceous; the flagellum black, slightly fulvous beneath. Thorax: a glassy-smooth and shining pale space enclosed by a suture; the wings hyaline and iridescent, the nervures dark fusco-ferruginous; the intermediate and posterior tarsi, the posterior tibiæ outside, except at their base, and a line on the posterior femora above black. The two apical segments of the abdomen thinly covered with white downy pile; beneath, the segments fringed with pale hairs.

*Hab.* New Guinea.

#### DESCRIPTION OF PLATE IV.

- Fig. 1. *Cladomacra macropus*, ♂. 1 *a.* Antenna of ditto.  
 Fig. 2. *Polyrhachis Neptunus*, ♀.  
 Fig. 3. *Formica (Myrmecopsis) respiciens*, ♀. 3 *a.* Head of ditto.  
 Fig. 4. *Pterochilus eximius*, ♂.  
 Fig. 5. *Cephaloxys capitata*, ♀.  
 Fig. 5 *a.* Under side of the head of ditto.  
 Fig. 5 *b.* Upper side of the head of ditto.  
 Fig. 6. *Myrmica quadrispinosa*, ♀.  
 Fig. 6 *a.* Thorax of ditto.  
 Fig. 7. *Cataulacus hispidulus*, ♀.  
 Fig. 8. *Pheidolacanthinus armatus*, ♀.  
 Fig. 9. *Spinaria sulcata*, ♀.

Account of a Heronry, and Breeding-place of other Water-birds, in Southern India. By JOHN SHORTT, M.D., F.L.S.

[Read Nov. 3, 1864.]

IN the Madras district, about fifty miles from Madras and twelve miles from Chingleput in a south-easterly direction, is a small village called Vaden Thaugul, which means literally "Hunter's Rest," from *vaden*, "hunter," and *thaugul*, "rest." To the south of the village lies one of those small tanks called *Thaugul* by the Tamil ryots, implying a water-rest or temporary reservoir, from which

the village derives its name; but why *Vaden* was added to it is not known. It is possible that, from its being the resort of numbers of birds, the people connected it with the term *vaden*, or "hunter," a name given to a rude class of people in Southern India who are known as hunters and birdcatchers, but who have never been found residing here. The Vaden Thaugul tank is situated N.N.W. of the Carangooly Fort, and is  $3\frac{1}{2}$  miles distant in a direct line from the Great Southern Trunk road.

The bund, whose greatest height is 12 feet, commences from a piece of high ground near the village, runs for a distance of about 600 yards in a south-easterly direction, then takes a sharp turn almost at a right angle, and terminates in high ground about 200 yards further. The water-spread is limited on the north-east by slightly rising ground overgrown with low jungle, and on the east-south-east by high gravelly and rocky ground. The area comprised in the tank is about four acres and a half (thirty cawnies \*).

From the north-east to the centre of the bed of the tank there are some 500 or 600 trees of the *Barringtonia racemosa*, from about 10 to 15 feet in height, with circular, regular, moderate-sized crowns; and when the tank fills, which it does during the monsoons, the tops only of the trees are just visible above the level of the water.

This place forms the breeding-resort of an immense number of water-fowl; Herons, Storks, Cranes, Ibises, Water-crows or Cormorants, Darters and Paddy-birds, &c., make it their rendezvous on these occasions.

From about the middle of October to the middle of November small flocks of twenty or thirty of some of these birds are to be seen, coming from the north to settle here during the breeding-season. By the beginning of December they have all settled down; each tribe knows its appointed time, and arrives year after year with the utmost regularity within a fortnight, later or earlier, depending partly on the seasons. Some, from the lateness at which they arrive, appear to have come from great distances. They commence immediately by building their nests or repairing the old ones, preparatory to depositing their eggs. When they have fully settled down, the scene becomes one of great interest and animation.

During the day the majority are out feeding, and towards evening the various birds begin to arrive in parties of ten, fifteen,

\* A cawnie is 6400 square yards.

or more, and in a short time the trees are literally covered with bird-life : every part of the crown is hidden by its noisy occupants, who fight and struggle with each other for perches ; each tree appears like a moving mass of black, white, and grey ; the snowy-white plumage of the Egrets and Curlews contrasting with, and relieved by the glossy black of the Water-crows and Darters and by the grey and black plumage of the Storks.

The nests lie side by side, touching each other ; those of the different species arranged in groups of five or six, or even as many as ten or twenty, on each tree.

The nests are shallow, and vary in inside diameter from 6 to 8 inches, according to the size of the bird.

The Curlews do not build separate nests, but raise a large mound of twigs and sticks, shelved into terraces as it were ; and each terrace forms a separate nest : thus eight or ten run into each other. The Storks sometimes adopt a similar plan.

The whole of the nests are built of sticks and twigs, interwoven to the height of 8 or 10 inches, with an outside diameter of 18 to 24 inches ; the inside is slightly hollowed out, in some more and in others less, and lined with grass ; reeds and quantities of leaves are laid on the nests. In January the callow young are to be seen in the nests. During this time the parent birds are constantly moving on the wing, backwards and forwards, in search for food, now returning to their young loaded with the spoil, and again, as soon as they have satisfied their cravings, going off in search of a further supply. About the end of January or early in February the young are able to leave their nests and scramble into those of others. They begin to perch about the trees, and by the end of February or the beginning of March those that were hatched first are able to take wing and accompany their parents on foraging expeditions ; and a week or two later, in consequence of the drying up of the tanks in the vicinity, they begin to emigrate towards the north with their parents and friends, except perhaps a few whose young are not as yet fledged, and who stay behind some time longer. Thus, in succession, the different birds leave the place, so that it is completely deserted by the middle of April, by which time the tank also becomes dry ; and the village cattle graze in its bed, or shelter themselves under the trees from the scorching heat of the midday sun, while the cow-boys find amusement in pulling down the deserted nests.

This village and tank are completely isolated from the public

thoroughfare, and very few seem aware of its existence. The villagers hold an agreement, from the ancient Nabob's government, which continues in force by a renewal from the British Government, that no one is to shoot over the tank, which is strictly enforced to the present day; and the birds continue in undisturbed possession of this place as a favourite breeding-resort every winter or monsoon.

The natives understand the value of the dung of the birds in enriching their rice-fields; and when the tank becomes dry, the silt deposited in its bed is taken up to the depth of a foot, and spread over the rice-fields; consequently they are careful not to disturb the birds.

When I first discovered the locality, I was under the impression that the birds were venerated from some superstitious motives, but an acquaintance with the villagers undeceived me as to this point. Anxious to examine the nests, I visited the locality at various periods when the tank was full of water, first in January, and subsequently on the 8th of March, 1864. I caused a raft of wood to be constructed for the occasion. On the last excursion I was accompanied by some of the European and native officials of the district; and we were pushed along on the raft by two fishermen swimming one on either side, their heads only visible above water, whilst the tank bund was lined with the villagers, who witnessed our operations with great curiosity. As we approached the trees the birds at first remained quite unconcerned, but as we got nearer they began to look on with amazement at a scene which was evidently new to them; then they rose *en masse* over our heads, and uttering piercing cries, some, with threatening gestures, rested a moment on the adjoining trees, and then took to their wings again: although so crowded, they performed their evolutions with the greatest nicety and dexterity, never interfering with each other's movements. Some ascended to a great height, and were hardly perceptible in the air, while others gyrated immediately above our heads; many crowded on adjoining trees, and witnessed our intrusion with dismay. On the first occasion, in January 1864, I was alone on the raft; most of the young of the Water-crows, Storks, Herons, and Darters were fully feathered, and were able to scramble to other nests, and some to the tops of trees; a few nests contained eggs, and others callow young. The Water-crows and Darters, young as they were, immediately took to the water and dived out of sight. On the second occasion, in March last, the young of the Ibises



were fully feathered, as were also a few Grey and Purple Herons and Darters; two or three nests only contained eggs, and some few callow young.

The following is a detailed account of the nests, and of the number of eggs, or young, I found in each nest on the different times I visited the place:—

1. The small Grey and Black Stork, *Leptoptilos Javanica*?; Tamil name, *Nutha coottee narai*; literally “Shell-fish- (*Ampullaria*) picking Crane.” These birds were the most numerous; their nests were two feet in diameter, and contained three eggs or young. The eggs were of a dirty-white colour, of the same shape, but not quite so large, as those of the Turkey. The young when fully feathered were in prime condition. The flesh is eaten by Mussulmans and Pariahs. I remember on one occasion, when one was shot in the jungles of Orissa, one of the Sepoys, a Bengal Bramin, begged for the dead bird, which was given him; and after eating it he came back to say he had enjoyed his dinner greatly. That he had made a hearty one was evidenced by his protuberant stomach. The bird is common about here, but keeps entirely to marshy fields, edges of tanks, &c.; it never approaches towns. Some half-dozen or more of these birds may often be seen in the morning sunning themselves with outstretched wings in the dry fields. They only differ from the Adjutant (or *Leptoptilos Argala*) in size and colour. These nest early, and the young are firm on the wing in the month of February.

2. The Ibis or Curlew, *Ibis Falcinellus*\*; Tamil, *Arroova mooken*, literally “Sickle-nosed,” which name they take from their long curved beaks. The nest of this bird contained from three to five eggs, and I found from three to four young in each nest. The eggs resemble in size and shape a medium-sized hen’s egg, but are of a dirty-white colour. The birds are white, with black head, feet, and neck, and have a long curved black bill. The head and neck are naked, and the tail-feathers of rather a rusty-brown colour; the lower sides of the wings, from the axillæ to the extremities, are naked; and the skin in the old birds is of a deep scarlet colour; in the young this is absent, although the part is naked. The young are fully fledged in March, and take to the wing in April.

3. The Grey Heron, *Ardea cinerea*; Tamil, *Narai*, sometimes *Pamboo narai*, or Snake Crane; has a similar nest, built of twigs, containing sometimes two, sometimes three eggs. I only found

\* *Falcinellus igneus*, Gould.

two young in the nests; they are fledged from January to April, according to the time of depositing their eggs, which some do earlier than others. The eggs are of a light-green colour; they are not so large in circumference as a large-sized hen's egg, but are longer, with the small end sharp.

4. The Purple Heron, *Ardea purpurea*; Tamil, *Cumbly narai*, or Blanket Crane. Nest the same; deposits two to three eggs, of same size and colour as last; seems to rear only two young. The young are fully fledged in April.

5. *Ardea Nycticorax*; Tamil, *Wukka*. Nests are built after the same fashion, but smaller in size, and contain five eggs; hatches four or five young; eggs the size of a bantam's, and of the same shape. The young are fledged in April.

6. The Cormorant, *Graculus pygmæus*; Tamil, *Neer cakai*, or Water-crow. Nest the same as the others, built of sticks; deposits three or four eggs, and rears three or four young, which are fledged and on the wing in January; eggs like those of a small-sized bantam's, rather sharp-pointed at small end, with a slight greenish tinge.

7. The Large Cormorant, *Graculus Siennensis*; Tamil, *Peroon neer cakai*, or Large Water-crow. Builds a very rude nest, chiefly formed of sticks; lays four eggs, and rears two, three, or four young. The eggs are the size of a medium-sized domestic hen's, and have a slight greenish tinge; the young are fledged sometimes in January, sometimes in March, according to the time of their nesting. These birds, as well as *G. pygmæus*, are to be seen fishing in the tank itself; and the rapidity with which they find their prey, by diving, is wonderful.

8. The Darter, *Plotus melanogaster*; Tamil, *Pamboo Thalai neer cakai*, or Snake-headed Water-crow. Nest same as last; three, sometimes four eggs of same size and colour; young fledged and on the wing, some in January, others not till April.

I succeeded in capturing young of all the birds described here, and sent them to the People's Park at Madras. I was in great hopes of sending a few of each to the Zoological Society's Gardens, Regent's Park, London, by Mr. Thompson, the head keeper, of whose intended visit to India in the "Hydaspes" the Secretary, Dr. Sclater, obligingly apprised me, but unfortunately I lost the opportunity, which I greatly regret.

Returning to the subject of Vaden Thaugul, the villagers tell me that the Pelican sometimes comes and breeds here, as also the

Black Curlew. Occasionally different kinds of Teal, Widgeons, &c., are said to nest in the rushes that bound the inner surface of the tank bund. But, although I visited this place frequently, I saw no other birds than those described here.

The Egrets, or *Herodias Garzetta*, *Bubulcus*, and *intermedia*, were congregated in very large numbers, and roosted on the trees at night; but they do not nest, which seems singular. The natives had observed this, and I found it to be the case. Yet I believe, of all the birds that assemble here, these occur in the greatest number. *Ardea alba*, or *Herodias alba*, and *H. intermedia* are also found here; and the natives say that they breed, but I did not find any of their nests in the place during my visits to Vaden Thaugul.

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A brief Account of the *Myrmica Kirbii* as found in Southern India. By JOHN SHORTT, M.D., F.L.S.

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SOME years ago, when in medical charge of the Ganjam trigonometrical survey, in the jungles of Orissa, my attention was drawn to nests of this species of Ant, which, I believe, has been described by Colonel Sykes. A trip last year to the Shervaroys gave me further opportunities of examining these nests more carefully, and also afforded me the opportunity of watching the habits of the ants, as they are very plentiful on this plateau; and believing that any information on the subject may prove interesting, I beg to submit a short account of the same to the Society.

The nests of these ants are built on different kinds of trees and shrubs. I have found them on the *Syzygium Jambolana*, *Coffea Arabica*, *Psidium pomiferum*, *Citrus Aurantium*, &c. The largest nest I ever saw was taken from a *Syzygium Jambolana* at Nagalore, Shervaroy Hills, and is now in my possession; it weighs 3lbs. 8oz., is irregularly oval in form, its extreme length is 19½ inches, its girth or circumference in the centre 32½ inches, and it is sufficiently solid to withstand moderate force. I had some difficulty in securing the nest, in consequence of the ferocity of its inmates; and the tree was of some height. The nest was situated about 30 feet from the ground, on a fork of the tree, and was built round some of the branches, which protruded through it in various directions; the girth of the thickest or lowermost